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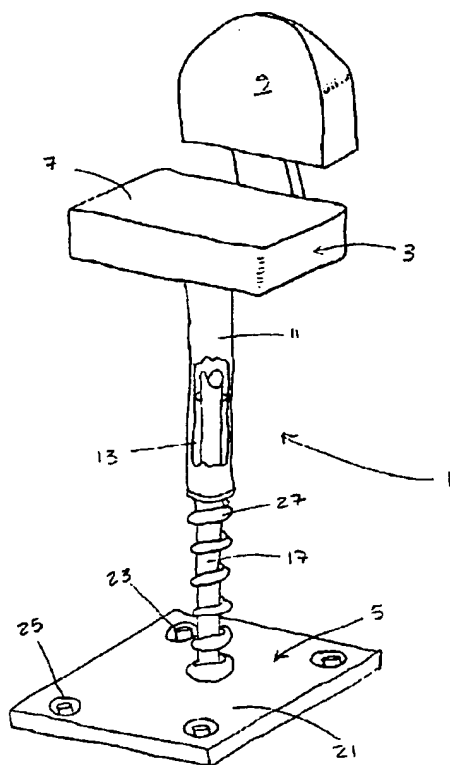
(54) SPRING SEAT ASSEMBLY

(57)

A seat assembly 1 having a lower portion 5, an upper portion 3 and a spring 27. The upper portion 3 includes a seat 7 and is movable relative to the lower portion 5. The spring 27 is removably associated with the lower portion 5 of the seat assembly 1. The spring 27 engages the upper portion 3 of the seat assembly 1 to dampen the ride felt by the user in the seat 7. Springs 27 of different stiffnesses, geometries and parameters can be used in order to accommodate user of different weights.



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ABSTRACT OF THE DISCLOSURE

A seat assembly 1 having a lower portion 5, an upper portion 3 and a spring 27. The upper portion 3 includes a seat 7 and is movable relative to the lower portion 5. The spring 27 is removably associated with the lower portion 5 of the seat assembly 1. The spring 27 engages the upper portion 3 of the seat assembly 1 to dampen the ride felt by the user in the seat 7. Springs 27 of different stiffnesses, geometries and parameters can be used in order to accommodate user of different weights.

TITLE OF THE INVENTION

Spring Seat Assembly

BACKGROUND OF THE INVENTION

The present invention relates generally to a seat assembly, and more particularly to a seat assembly which can accommodate users of varied weights.

Conventional seats in vehicles, such as boats, are often uncomfortable to the user. Most conventional seats are bolted directly to the floor of the vehicle. Although sturdy, such seats transmit the vibrations and bumps associated with vehicular travel directly to the user of the seat. Extended travel, particularly across water, can cause extreme discomfort to the user. Clearly, there is room for improvement in the art.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a comfortable seat assembly.

Another object of the present invention is to provide a seat assembly which can accommodate users of varying weights with varying support.

It is a further object of the present invention to reduce the amount of vibration and bumps transmitted from the vehicle to the user of the seat.

These and other objects are achieved in one aspect of the present invention by a seat assembly having: a lower portion, an upper portion, and a spring. The upper portion includes a seat and is movable relative to the lower portion. The spring is removably secured to the lower portion of the seat assembly. The spring engages the upper portion of the seat assembly to dampen the ride felt by the user in the seat. Springs of different stiffnesses, geometries and parameters can be used in order to accommodate user of different weights.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention will become apparent to those skilled in the art to which the present invention relates from reading the following specification with reference to the accompanying drawings in which:

Figure 1 is a perspective view, with a portion cut away, of a first embodiment of the present invention;

Figure 2 is an elevation view of a lower portion of the first embodiment of the present invention shown in Figure 1;

Figure 3 is a cross-sectional elevation view of part of an upper portion of the first embodiment of the invention shown in Figure 1; and

Figure 4 is a perspective view of a second embodiment of the spring seat assembly.

DETAILED DESCRIPTION

Figures 1-3 display one embodiment of the present invention. Figure 1 shows seat assembly 1. Seat assembly 1 has an upper portion 3 and a lower portion 5. Upper portion 3 includes any conventional seat 7. If desired, seat 7 could include a backrest 9, armrests (not shown) or any other conventional fixture. A hollow shaft 11 extends from the bottom surface of seat 7. Shaft 11 is secured to seat 7 using any known technique. For example, the proximal end of shaft 11 can be secured within an aperture in the bottom surface of seat 7 using an interference fit.

Figures 1 and 2 display lower portion 5 of the seat assembly 1. Lower portion 5 includes a base 21 for securing seat assembly 1 to a stable object (not shown) such as the floor of a boat. Base 21 secures to the stable object using known techniques, including fasteners 23

extending through a plurality of apertures 25. Rod 17 extends from an upper surface of base 21.

As seen in Figure 3, a bushing 13 rests on a shoulder 14 of shaft 11 and fits within the distal end of shaft 11. Bushing 13 secures the distal end of shaft 11 using an interference fit but which permits rotation and longitudinal movement. Bushing 13 is preferably manufactured from nylon, but other suitable materials may also be used. Inner aperture 15 of bushing 13 receives a distal end of a rod 17 from lower portion 5, and will be described in greater detail below.

Bushing 13 forms a receiving area 29 within shaft 11. Receiving area 29 is to help maintain the rod 17 within the shaft 11. Bushing 13 includes a bearing surface 19. The bearing surface 19 engages the distal end of spring 27.

Upper portion 3 is removably supported by lower portion 5. Referring again to Figure 1, the distal end of rod 17 extends into the hollow of shaft 11 through bushing 13. Central aperture 15 of bushing 13 receives rod 17 therein. Bushing 13 retains the rod 17 in an axially alignment with shaft 11. Bushing 13 allows shaft 11 to slide relative to rod 17. Therefore, the position of upper portion 3 relative to lower portion 5 depends upon the displacement of rod 17 within shaft 11 which is dependent upon the weight of the user and the stiffness of the spring 27.

Compression spring 27 controls the extent to which rod 17 extends into shaft 11. Spring 27 extends from base 21 and encircles a portion of rod 17. In the operating position shown in Figure 1, a distal end of spring 27 engages bearing surface 19 of bushing 13. Spring 27 dampens the movement between upper portion 3 and lower portion 5. Spring 27, in

essence, cushions rider on seat 7 and acts as a shock absorber.

Spring 27 is removably positioned on base 21. By using a removable spring 27, seat assembly 1 can accommodate users of varied weights by removing upper portion 3 from lower portion 5, selectively placing a properly sized and stiffened spring 27 on base 21, and reconnecting upper portion 3 on lower portion 5.

Each spring 27 is sized for a specific user's weight range. The stiffness, geometry and properties of an individual spring 27 are selected to appropriately accommodate a user's weight. A stiffer spring 27 is used for heavier users and a less stiff spring 27 is used for lighter weight users. Preferably, the present assembly offers three springs 27. One spring 27 is operable with users less than 180 pounds. Another spring 27 is operable with users between 180 and 230 pounds and yet a third spring 27 is operable with users over 230 pounds.

Figure 4 is a perspective view of an alternative or second embodiment of the spring seat assembly 1. This embodiment is directed to a spring seat assembly 1 having a seat 7 that sits atop a seat plate 43 and is attached thereto by any conventional connecting means. In this embodiment, the seat 7 is attached to the seat plate 43 by screws 41 inserted through apertures 39 located in the seat plate 43. The screws 41 protrude through the apertures 39 into the lower or bottom portion of the seat 7 thus connecting the seat 7 to the seat plate 43. A hollow shaft 11 is welded to the seat plate 43. Rod 17 extends up into the hollow shaft 11 similar to the relationship described in the first embodiment. A spring 27 encircles the rod 17 and rests at its lower end 45 to a plug element 35. The plug element 35 is capable of being inserted into a mating notch (not shown) which is connected to or integrally made with the support surface. Once the plug element 35 is inserted into the mating notch, the plug element 35 is retained

therein hence connecting the seat assembly 1 to the support surface.

The opposite or upper spring end 31 rests on bushing 13 which rests on shoulder 14 of the hollow shaft 11 while the rod 17 extends up inside the core of the hollow shaft 11. The spring 27 provides a resistance to shock and movement for the user seated on the seat 7 because of its location between the plug element 35 (and hence the support surface) and the seat 7. By placing the plug element 35 into a mating notch in the support surface, the seat assembly 1 is then placed in an upright position rod 17 connected at one end to the plug element 35 and spring 27 resting on plug 35 at one end and at the other end contacting bushing 13 while the rod 17 extends up within the hollow shaft 11. Hollow shaft 11 is welded at its opposite end to the seat plate 43 by weld 37 and the seat plate in turn is then connected to the seat 7 by a plurality of connecting means such as screws 41 inserted through holes 39 in the seat plate 43 and extending into the bottom of the seat 7.

The spring 27 provides for an up and down movement of the seat 7 as well as a rotation in either a clockwise or counter-clockwise direction around the rod 17 inside the hollow shaft 11.

It is thus seen that the present invention provides a comfortable seat assembly 1 that accommodates users of varying weights as evidenced by the use of different sized springs 27 with different stiffnesses. The spring seat assembly 1 also reduces the amount of vibration and bumps transmitted from the vehicle to the user of the seat 7 through the combination of the spring 27 and the hollow shaft 11 that can slide and rotate about the central rod 17.

The spring seat assembly 1 described herein and illustrated in the drawings is subject to other advantages and modifications that may be apparent to those of ordinary skill in the art

without departing from the spirit and scope of the appended claims. Accordingly, the invention is to be limited only by the scope of the following claims and their equivalents.

CLAIMS

I claim:

1. A seat assembly, comprising:
a lower portion;
an upper portion including a seat, said upper portion movable relative to said lower portion; and
at least one spring connected to said lower portion and engaging said upper portion.
2. The seat assembly of claim 1, wherein:
said lower portion has a base and said seat has a bottom surface, and further comprising
a rod being connected to said base; and
a hollow shaft connected to said bottom surface.
3. The seat assembly of claim 2, wherein:
said rod is encircled by said spring and said rod engages said hollow shaft such that said upper portion rests upon said lower portion.
4. The seat assembly of claim 3, wherein:
said hollow shaft is connected to said bottom surface.

5. The seat assembly of claim 4, wherein:

said rod has a cross-section shape the same as and smaller in size than the cross-section shape of said hollow shaft;

said rod is inserted into said hollow shaft; and

said upper portion rests above said lower portion.

6. The seat assembly of claim 5, wherein:

said hollow shaft has a shoulder at a proximal end thereof and further comprising a bushing pushed against said shoulder and within said hollow shaft; and

said bushing having a central aperture.

7. The seat assembly of claim 6, wherein:

said central aperture maintains said rod in a position within said hollow shaft yet allows said shaft to slide and rotate relative to said rod.

8. The seat assembly of claim 7, further comprising:

a back attached to said upper portion whereby a user can sit in said seat and lean against said back.

9. The seat assembly of claim 8, wherein:

said spring can accommodate weights less than 180 pounds.

10. The seat assembly of claim 9, wherein:

said spring can accommodate weights between and including 180 and 230 pounds.

11. The seat assembly of claim 10, wherein:

said spring can accommodate weights greater than 230 pounds.

12. A seat assembly, comprising:

a lower portion having

a support surface,

a base,

a connecting means for connecting said lower portion to said support surface,

a rod integrally connected with said lower portion, and

a spring resting upon said base and encircling said rod;

an upper portion including a seat having a bottom portion;

a shaft connected to said bottom portion of said seat;

said upper portion being movable relative to said lower portion; and

said spring engaging said shaft of said upper portion,

whereby a user sitting in said seat can move relative to the support surface.

13. The seat assembly of claim 12, further comprising:

a bushing located on a shoulder of and within said hollow shaft and

said bushing having a central aperture and a bearing surface.

14. The seat assembly of claim 13, wherein:

said bearing surface engages an end of said spring; and

said central aperture maintains said rod in position within said hollow shaft while allowing said shaft to rotate and slide relative to said rod.

15. A seat assembly for mounting on a support surface, comprising:

a seat;

a seat plate connected to and supporting said seat;

a hollow shaft connected to said seat plate;

a rod;

a spring;

a plug element connected to said rod;

said rod being inserted into the hollow of said hollow shaft and being encircled by said spring;

said shaft resting upon and supported by said spring;

said plug element being adapted for insertion into a mating notch on a support surface and allowing said seat assembly to stand in an upright position on said support surface.

16. The seat assembly of claim 15, wherein:

said spring contacting a shoulder of said hollow shaft; and

said spring resting upon said plug element;

whereby said spring in said seat assembly allows for said seat to move in an up and

down motion and said rod within said hollow shaft allows for said seat assembly to move in a clockwise and counter-clockwise direction.

17. The seat assembly of claim 16, further comprising:
a bushing located on a shoulder of said hollow shaft and
said bushing has a central aperture and a bearing surface.

FIG. 1

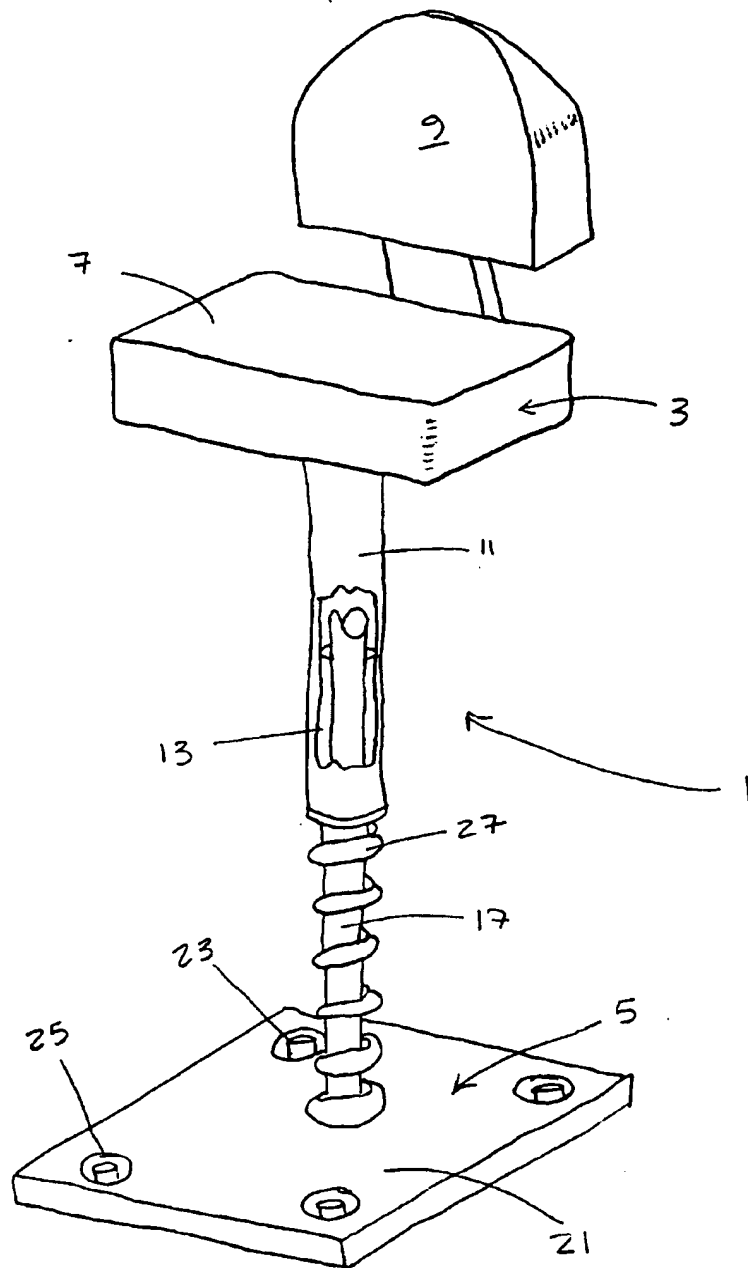
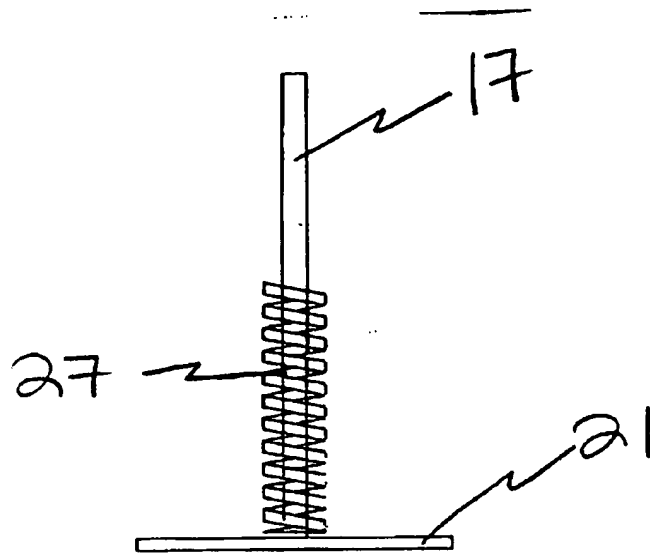


FIG. 2



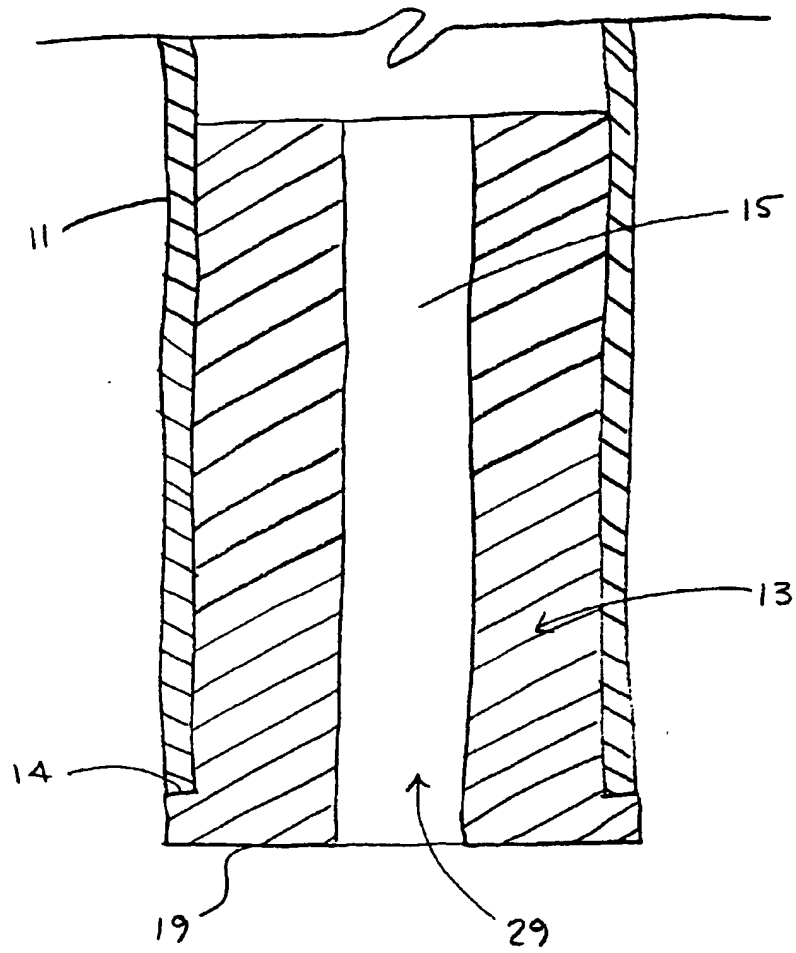


FIG. 3

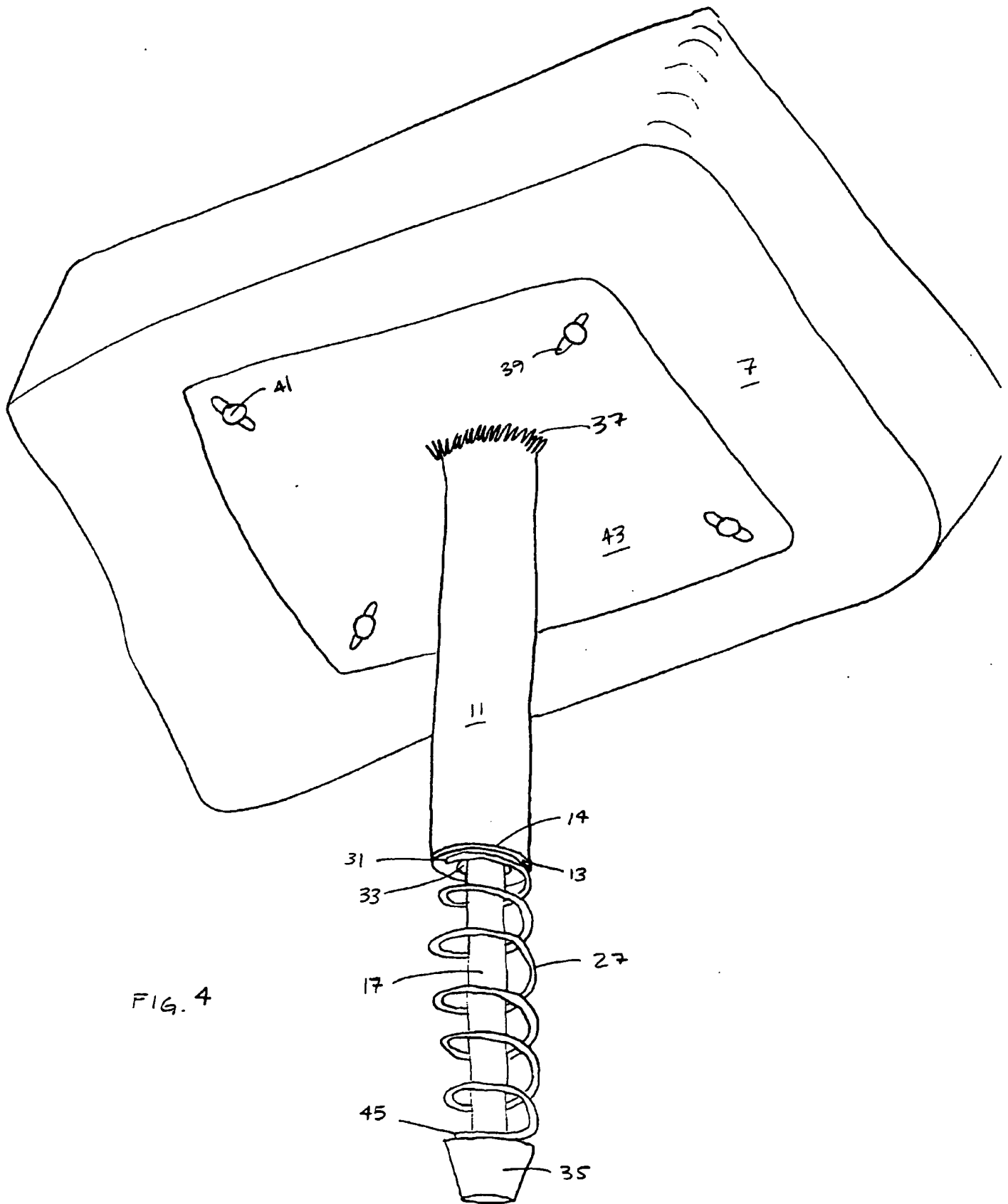


FIG. 4